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CAPABLE OF MEETING MILITARY REQUIREMENTS

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CAN THE U. S. MERCHANT MARINE BE CAPABLE  
OF MEETING MILITARY REQUIREMENTS?

by

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## SUMMARY

This study determines that the United States Merchant Marine is in a deteriorated state, having shrunk to fifth place in world merchant fleets. Much of the U. S. vessel inventory is obsolete and Vietnam experience has shown that we lack the resources to augment our naval forces in support of an overseas theater. An examination is made of a bill to amend the 1936 Merchant Marine Act; provision is made for changes in construction and operating programs and the elimination of the obsolete portions of the 1936 Act. This bill, coupled with new cargo handling techniques and advances in vessel design, will provide the United States with a merchant marine capable of competing with other nations and will reestablish the merchant fleet as a mobilization asset, capable of providing logistical support in time of national emergency.

## THE ROLE OF THE MERCHANT MARINE

The purpose of this study will be to examine the role of the U. S. Merchant Marine as a part of the concept of strategic mobility. The merchant marine has a dual role, that of supporting world trade and that of supporting our strategic posture in the provision of sealift capacity to support necessary operations throughout the world.

In a paper of this type it is necessary to establish certain parameters in order to define the data to be discussed. Thus, in this paper only the role of the commercial merchant ship is discussed. Construction programs of the Navy and Air Force are purposely avoided. Historical experience and background of our present plans for strategic mobility are not discussed. Unfortunately, legislation vital to the success of projected improvements in our readiness posture and supporting activities is pending. However, basic premises will become apparent and favorable legislation to support these programs will undoubtedly emerge.

The importance of sealift capacity cannot be denied. In an era of technological advances, producing aircraft such as the C-5A, the role of ocean vessels in the support of overseas operations is often minimized. Most recent experience factors must be applied and logistical support of Vietnam forces gives us pertinent data. Here, we find that sealift by MSTs, now referred to as Military Sealift Command (MSC), provided in excess of 95 percent of logistical support, a volume of some 10 million tons annually. Of the 536

vessels controlled by MSTs, as of 1 September 1968, only 155 ships were operated by the U. S. Navy, while 381 vessels were operated by commercial steamship lines.<sup>1</sup> The importance of the role of the merchant marine is of prime consideration and despite advances in other modes, sealift can be expected to continue as the backbone of logistical support to overseas theaters.

#### PRESENT STATUS OF THE MERCHANT MARINE

Under the single manager concept, the Secretary of the Navy has been assigned responsibility for sealift. The Commander, Military Sealift Command, provides common user ocean transportation of cargo and passengers for the Department of Defense. As a result of a 1954 agreement between the Department of Defense and the Department of Commerce, provision of merchant vessel support is obtained from the following sources in the order named:

1. Vessels owned and operated by MSC.
2. Regularly scheduled U. S. commercial ships.
3. Non-scheduled privately owned U. S. vessels under time or voyage charter.
4. Vessels of the National Defense Reserve Fleet operated by commercial shipping companies acting as agents for the National Shipping Authority.

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<sup>1</sup>US Department of the Army, Special Text 55-153: Defense Transportation System(Fort Eustis: December 1969), p. 35.

5. Foreign Flag vessels utilized when U. S. vessels are not available.

Due to the deteriorated state of our merchant marine the needs for logistical support of Vietnam forces exceeded the number of ocean bottoms to be found in the first three categories. The vessels in the fourth category, NDRF, do not constitute a panacea for the solution of emergency shipping requirements. As far back as 1962, of the 1253 dry cargo ships in the reserve fleet, it was recommended that 900 be scrapped. This mothball fleet, largely consisting of World War II vessels, averages 25 years of age and despite preservative precautions, these ships are dubious assets. Their state of disrepair and unreliability was only too apparent when a portion of these vessels was withdrawn to meet Vietnam requirements.

The last source, foreign flag vessels, does not offer a ready solution. Experience has shown that normally friendly or neutral vessel operators are not always sympathetic to our objectives and cannot be relied upon to venture into our operational areas. Again, Vietnam experience has provided valuable lessons in the adequacy of our fleet to meet demands. At one time it was found necessary to charter one-fourth of the required tanker fleet from foreign sources.<sup>2</sup> The inability of the most advanced nation in the world

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<sup>2</sup>Speech by A. E. Gibson, US Department of Commerce, before the Propellor Club, Port of San Diego, 22 May 1970.

to meet its shipping requirements is of serious consequence.

#### MERCHANT MARINE LEGISLATION

A deteriorated merchant marine with only approximately 200 vessels of modern design, a fleet whose obsolescence and inadequacy has been brought to light by Vietnam experience, requires examination if our ocean going capability is to support our world trade and provide for national defense.

In recognition of obvious discrepancies in the 1936 Merchant Marine Act, the Administration is supporting a bill to revitalize the U. S. Merchant Fleet. It is anticipated that this bill will become law shortly. To support this legislation the authorization for Fiscal 1971 program funds has already been signed by the president. Supporters of the bill present many valid arguments for its passage. Our Balance of Payments position would improve as our shippers would be able to increase their use of modern competitive U. S. flag vessels in foreign commerce. Currently our merchant fleet has shrunk to fifth place in the world shipping nations and only carries five to eight percent of the nation's foreign trade. The proposed program is seen as a boost to employment and protection of shipbuilding skills, it provides for modernization of U. S. shipbuilding facilities, encourages innovative vessel design, and produces new economies through new techniques of construction and standardization of vessels. In addition, the program will provide a merchant fleet capable of augmenting our naval forces in time of emergency.

The bill provides for the construction of 300 ships over the next 10 years to replace the obsolete worn-out vessels now in foreign trade. Three quarters of U. S. vessels actively engaged in foreign trade are over twenty years of age and overdue for retirement. Not only are these vessels in a deteriorated state and uneconomical to operate, but also, obsolete as to methods of cargo stowage and discharge. To prevent a recurrence of the present condition of our merchant fleet, the bill provides for continuing modernization. Operators will be able to defer corporate income taxes by putting profits into a special reserve fund for future ship construction.

#### Subsidy Programs

The United States Merchant Marine has been assisted through two types of subsidies; construction differential subsidy, and operating differential subsidy. The construction differential provides a governmental subsidy to pay the difference in acquisition cost to the operator between construction in a U. S. shipyard as opposed to the lower cost of the same vessel constructed in a foreign shipyard. The operating differential in like fashion compensates between the costs of operating with American crewmen as contrasted with the wages of foreign crews. Wages for U. S. seamen can run as much as four times the pay of foreign crews.<sup>3</sup>

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<sup>3</sup>"U. S. Aid for Ocean Liners," St. Louis Post Dispatch, August 26, 1970, p. 8.



The subsidy program to vessel operators is not unique to U. S. shipping. Our major free nation competitors, Britain, Norway, and Japan are among the many nations with assistance programs to assist their fleet operators in acquiring vessels through construction loans and/or retention of profits to replace aging ships.

Construction subsidies are available to operators engaged in foreign shipping; operating subsidies under the 1936 Merchant Marine Act were directed to the passenger liner trade. Under the proposed amendments to the 1936 Act, the operating subsidies will also include carriers of bulk cargo or products vital to the interests of the United States. As these vital subsidy programs are essential to the revitalization of our merchant marine, each will be discussed separately.

#### Construction Differential Subsidies

The proponents of the amendments to the 1936 Act propose a reduction in the construction differential subsidy. Currently, the government will defray up to 55 percent of construction costs based upon the lower costs for the same vessel in foreign yards. It is proposed that the subsidy be reduced five percent per year until 1976 at which time a 35 percent maximum differential will be reached. The premise for this reduction is based upon increasing efficiency of construction techniques and standardization of vessel design. It is felt that this program will force American shipyards to adopt and develop new methods and thus modernize shipbuilding practices. The Maritime Administration has contracted

with Newport News Shipbuilding and Bath industries to develop, in coordination with vessel operators, designs for standardized highly productive ships to meet trade demands. Under proposed procedures either the shipyard or the operator can be applicant for the subsidy. As a participant in the subsidy the shipyard will enter into design work on the standardized vessels to achieve maximum economy.

The 1952 amendments to the Merchant Marine Act specifically prohibited trading restrictions on vessels built under construction subsidies. This was done in an effort to encourage vessel operations in trading areas not eligible for operating subsidies. The new bill will authorize the Secretary of Commerce to place trading restrictions on vessels built under subsidy to insure that ships built with this aid will be used to promote, develop, expand, and maintain the foreign commerce of the United States. Thus, if an applicant receives a construction differential subsidy to construct a vessel to participate in a given trade area, he will be held to his contract.

Title XI loan insurance provides for the insurance of mortgages held on vessels acquired by borrowed capital. At the present time, the limit on outstanding mortgage insurance is limited to one billion dollars and a down payment, by the operator, of 25 percent is required. Under the new provisions, the government would be authorized to increase the outstanding insurance threefold to three billion and would require a down payment of  $12\frac{1}{2}$  percent. This action will increase monies available for vessel construction

and ease financial requirements of operators.

### Operating Differential Subsidies

With the possible exception of the North Atlantic and the North Pacific trade routes where our commerce consists largely of the shipment of manufactured commodities, and where some of our most modern vessels and cargo techniques are in service, much of our foreign shipping requires an operating subsidy if our ships are to compete with foreign vessels.

The operating differential subsidy was originally planned to assist in the support of American flag liners in order to provide service on all routes essential to U. S. foreign commerce. This policy applied to liner routes and supported operators in passenger service. The increasing requirements of the United States to obtain raw materials and petroleum products and the decline in passenger service, due to low cost air travel, has rendered the provisions of the 1936 Act obsolete. Under the proposed amendments to the Act, the word "capacity" is recommended to replace the terminology "service on all routes." Thus, the new provisions include all types of vessels to include bulk carriers and would provide subsidies to assure shipping capacity essential to maintaining the flow of commerce.

The amendments provide that the Secretary of Commerce will have the power to determine the amount of subsidy necessary to compensate for the difference between costs of operating a U. S.

vessel and those costs of operating a vessel under foreign registry.

In addition to wage differentials, other aspects of the operating differential subsidy apply to insurance, maintenance and repair, subsistence on passenger liners, and recapture of profits. Specifically excluded from benefits of operating subsidies are wages of executives, managers, and administrative personnel.

To summarize, the objective of the proposed amendments to the existing subsidy programs of the Merchant Marine Act is to improve the competitive position of U. S. operators in relation to operators of other nations competing in foreign trade. The construction differential would be available to all operators and other amendments tend to equalize benefits to all operators regardless of whether or not they receive an operating differential. The subsidy programs as envisioned by the changes to the Act are designed to modernize the vessels of our merchant fleet and revitalize the industry. The obsolete provisions of the Merchant Marine Act are recognized. The amendments provide changes to up-date the support of U. S. vessels to enable survival and growth despite competition from other nations. Not only will the economic basis for vessel operators be improved, but by providing a modern fleet of merchant vessels our national defense posture will be enhanced and our mobilization asset improved.

#### NEW INNOVATIONS

Recent cargo vessel design innovations have done much to

advance the capability of merchant vessels to accomodate vehicles and the containerization requirements of modern logistical support. In an effort to meet foreign competition on ocean routes, new vessel designs have done much to reduce handling costs and expedite the stowage and discharge of cargo.

The conventional ships of World War II were of the break bulk cargo stowage design requiring individual handling of the items stowed aboard the ship. Utilizing logistical figures considered valid for military planning purposes, a Victory Ship can be discharged by an Army Terminal Service Company at the rate of 720 short tons per day.<sup>4</sup> This is contrasted with a roll on/roll off COMET class vessel which has the capability of being unloaded at the rate of one thousand short tons per hour.<sup>5</sup> Not only is the vessel loading and discharge of conventional vessels a slow process, but also the cargo handling gear of this type of ship is antiquated and limited as to heavy lift capacity.

In planning logistical support and assuming adequate sealift capacity a limiting factor is port capacity. Port capacity refers to the ability of the port to receive cargo of discharge. Such factors as berthing facilities, warehousing, handling gear, labor, and available rail and road networks for port clearance are major considerations. New handling methods and vessel design to facili-

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<sup>4</sup>US Department of the Army, Field Manual 101-10-1: Staff Officers' Field Manual Organization, Technical, and Logistical Data(Washington: January 1966), p. 7-2.

<sup>5</sup>Ibid., p. 7-6.

tate these innovations have done much to expedite vessel turn around time and port requirements. In an effort to reduce handling costs and achieve a peacetime competitive position, these new techniques have provided a bonus affect as they are readily adaptable to provide more effective logistical support in a theater of operations.

### Cargo Handling Methods

Containerization is probably the one technique which has done the most to improve the U. S. Merchant Marine position. "Containerization" is the term for assembling of loose items of cargo and combining them into a shipping container. The strapping of related items of cargo to pallets was practiced in World War II. This was only partially successful as the pallets were often difficult to discharge in overseas theaters. In many remote areas it was necessary to break the pallets down to facilitate discharge and transportation. This was not a fault of the theory of unitization but rather a lack of adequate handling gear at the port of discharge.

Containerization as now practiced has become a vital factor in transport economy. Containers serve both military and commercial users and the sizes vary with the land transport method and the vessel upon which they are loaded. Standardization of container sizes include international agreements in order to assure interchangeability between rail, highway, and marine modes of transport.

Container sizes range from the familiar six by six by eight foot CONEX container capable of handling 9,000 pounds of cargo to the van type measuring up to eight by eight by forty feet with a capacity of 67,200 pounds. Variations of cargo containers are designed to meet differing requirements. Dry cargo, refrigerated, and bulk liquids are among the shipment accommodated.

Containers have proven highly successful in the prevention of loss damage and pilferage. They facilitate the documentation of cargo and minimize the handling of the items in a shipment. They may be loaded at the point of origin, transported on land, sea, and even air, before being opened and the cargo broken down.

An excellent example of the economies obtained is illustrated by a recent Vietnam shipment. A shipment of 307 measurement tons was made in eight containers from Tracy General Depot, California, to Da Nang. Utilizing a commercial container transport firm, Sea Land Service, Inc., the cost was \$13,231, as opposed to \$22,248, the cost of a conventional shipment, a saving of over \$9,000.<sup>6</sup>

Other technical innovations for the handling of cargo include roll on/roll off trailer shipments and the use of barge transport vessels. As these innovations are a result of vessel design, they will be discussed in the next section.

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<sup>6</sup>US Department of the Army, Special Text 55-152: Through Movement by Containerization(Fort Eustis: August 1969), p. 7.5.

### Vessel Design

To keep up with technological advancements in cargo handling, and to achieve economies of operation, an entirely new concept of vessel design has evolved. In the past 15 years our merchant fleet has been upgraded by over 150 ships of the most modern design. While our passenger liner role has declined, a new group of large fast cargo vessels has taken the lead in advanced merchant ship design.

Fortunately these new designs not only facilitate economic survival and growth of private vessel operators but they also lend themselves to logistical support of overseas theaters. The requirements for port facilities are no longer a total limiting factor. Dependence upon shore based support is lessened through the advance design of many of the new vessels and their newly acquired flexibility in methods of rapid cargo discharge.

The failure of Congress to authorize the Fast Deployment Logistic Ship (FDL) program has resulted in a search for other means of meeting emergency sealift requirements. One alternative has been to provide for the design of merchant vessels capable of meeting peacetime competition and also of providing sealift capacity in time of emergency. Although privately owned vessels lack the immediate availability of FDL ships they do constitute a valuable resource. New airlift capacity such as the C-5A can provide immediate response and a modernized sealift capacity will improve our present position. It is true that certain of



the containerships require sophisticated port facilities but other vessels such as barge transports give us a new viable design.

While there will always be a requirement for conventional break bulk cargo handling in the underdeveloped ports, the volume of shipping from these areas is low. The provision of cargo space for conventional break bulk discharge is at a minimum in many of the new ships. Several of the later model conventional ships, rigged for break bulk cargo, have been structurally altered and cargo gear modified to facilitate container stowage.

Basically, the new vessel designs are related to handling techniques and the containerization of cargo. Three principles are involved; lift on/lift off, roll on/roll off, and the lighter aboard ship (LASH) concept.

Of the three, the least innovative is the first category, the lift on/lift off, containership. This closely approximates the conventional ship but it is designed to meet the requirements of container stowage. The vessels are characterized by large unobstructed hatches and holds and greater capacity of the ship's cargo gear. Some of the containership designs provide for break bulk conventional stowage in the wings of the hatches, others provide a roll on/roll off capability through side ports. A few vessels, usually conversions to containerships, are designed to be loaded and unloaded by shore facilities and have no ship-board handling capability.

In the North Atlantic and North Pacific sea routes our new

containerships have demonstrated their ability to compete by capturing more than 50 percent of the container trade. This is in competition with the best vessels that competing nations have put to sea.

The roll on/roll off ship is of great significance to logistical planners as 90 percent of the cargo moved overseas in the deployment phase consists of wheeled or tracked vehicles. The COMET, built in 1958, was the first vessel of this design and provides four sideports and a stern ramp, giving her the ability to discharge four hundred vehicles in an hour and a half. Needless to say, the commercial application of this vessel is limited but it possesses high military value. Currently two vessels are in our inventory, two other ships have been converted to this service, one modern gas turbine, commercially owned ship is under charter, and others are under construction. With these new ships, our deployment capability is being substantially increased.

The LASH concept presents our most radical departure and a commercial design with great potential for logistical support. Contracts for the construction of three vessels was awarded to General Dynamics for use by the Lykes Brothers Steamship Company.<sup>7</sup> In addition, other steamship companies have indicated a desire

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<sup>7</sup>"General Dynamics is Building a Huge Cargo Carrier," New York Times, July 16, 1970, p. 58.

to contract for 18 similar vessels in the next decade.<sup>8</sup>

The Lykes See Bee is a gigantic vessel, 875 feet long with a 106 foot beam and drawing 36 feet when fully loaded. Displacing over 50,000 long tons, the ship will have a capacity of 38 barges, each measuring 35 by 97½ feet, and capable of transporting up to 850 tons. Discharge is accomplished by a two thousand ton stern elevator. Port requirements are minimized as the ship can be discharged in a protected anchorage and the barge with its cargo intact transported to shore or up inland waterways. As a container-ship the See Bee can handle up to 1800 containers with a discharge rate of 48 forty foot containers per hour. As a roll on/roll off ship the vessel offers three and a half miles of single lane roadway.

This new vessel design, a sophisticated version of the LSD, is probably the most ideal concept of a multi-purpose vessel. A ship offering economies of service to commercial users and a vessel of extreme value in times of rapid deployment of our armed forces.

#### CONCLUSIONS

The ability of the U. S. Merchant Marine to provide adequate sealift to augment the Military Sealift Command in time of emergency is, at the moment, inadequate. The failure of Congress to support the FDL program and the obsolescence of our National Defense Reserve

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<sup>8</sup>Ron Coonin, "Ten Operators Submit Building Plans to MARAD", Department of Commerce News, September 2, 1970, p. 1.

Fleet has contributed to this condition.

Much of this study has related to the proposed amendments to the 1936 Merchant Marine Act. This legislation is supported by the Administration, has passed both the House and the Senate and awaits Presidential signature.<sup>9</sup>

New vessel design and cargo handling techniques have paved the way to meet the competition of foreign nations. While reliable sources anticipate that our fleet will only equal 75 percent of the Russian deadweight tonnage in 1980, the increased productivity of the United States vessels will far exceed that of the Soviets.

The new maritime program as visualized by President Nixon provides for a balanced fleet of bulk carriers, tankers, and cargo ships. Standardized design will lower construction costs and new techniques of handling cargo and vessel operation will reduce operating costs.

In summary, to address the problem indicated in the title of the paper; "Can the U. S. Merchant Marine be Capable of Meeting Military Requirements," the answer could be; Yes! This is dependent upon the adequacy of legislation to support the revitalization program, this is nearly an accomplished fact. We have proven that we can successfully compete with foreign nations in many areas of the world. Our objective can best be stated:

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<sup>9</sup>Telephone conversations, Office of Senator Stuart Symington, St. Louis, Mo., October 12, 1970.

" A United States Merchant Marine capable of peacetime transportation of U. S. foreign commerce is a merchant Marine capable of augmenting our naval forces to meet logistical requirements in time of national emergency."



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# BIBLIOGRAPHY

1. Clark, Clifford M. The 1970 Defense Budget and Defense Program for Fiscal Years 1970-74. Washir gton: US Government Printing Office, 1969.
2. "Conferees Back Bill on New Ships," St. Louis Post Dispatch October 10, 1970, p. 22.
3. Coonin, Ron M. "Ten Operators Submit Building Plans to MARAD," Department of Commerce News, September 2, 1970.
4. Department of Commerce, Maritime Administration, Notice, "Projected Standard Ship Design," Washington: May 4, 1970.
5. Fair, Marvin L. and Williams, Ernest W. Economics of Transportation, New York: Harper and Brothers, 1950.
6. "General Dynamics Is Building a Huge Cargo Carrier," New York Times July 16, 1970, p. 58.
7. Gibson, A. E. Statement of Maritime Administrator Before Senate Subcommittee on Merchant Marine on Senate Bill S. 3287. Washington: US Department of Commerce, March 2, 1970.
8. Gibson, A. E. Statement Before the Propellor Club, Port of San Diego, California. Washington: US Department of Commerce, May 22, 1970.
9. Gibson, A. E. Statement Before the Seapower Committee of the Committee on Armed Services. Washington: US Department of Commerce, June 23, 1970.
10. Laird, Melvin R. Fiscal Year 1971, Defense Program and Budget. Washington: US Government Printing Office, 1970
11. Lansing, John B. Transportation and Economic Policy, New York: The Free Press, 1966.

12. Locklin, Phillip D. Economics of Transportation, Homewood, Illinois: Richard D. Irwin, Inc., 1966.
13. Lykes Steamship Lines, Conversion of Break Bulk Ships, News Release, Public Relations Department, New Orleans: 1970.
14. Lykes Steamship Lines, The Sea Bee System, Booklet, Public Relations Department, New Orleans: 1970.
15. Symington, Stuart Office of the Senator from Missouri, Telephone Conversations, St. Louis: October 9 and 12, 1970.
16. "U. S. Aid for Ocean Liners," St. Louis Post Dispatch August 26, 1970, p. 7.
17. US Department of the Army. Field Manual 101-10-1: Staff Officer's Field Manual Organization, Technical, and Logistical Data. Washington, D.C.: 1966.
18. US Department of the Army. Special Text 55-151: Strategic Mobility. Fort Eustis, Va.: November 1968.
19. US Department of the Army. Special Text 55-152: Through Movement by Containerization. Fort Eustis, Va.: August 1969.
20. US Department of the Army. Special Text 55-153: Defense Transportation System. Fort Eustis, Va.: December 1969.
21. US Department of the Army. Special Text 55-159: Movements Management Guide. Fort Eustis, Va.: June 1968.
22. US Senate Bill 3287. Introduction of a Bill Amending the Merchant Marine Act of 1936. Washington: US Government Printing Office, 1970.
23. Wilson, G. Lloyd. The Elements of Transportation Economics, New York: Simons Boardman, 1950.